# Rapporteurs' Report on FIRST "IMM Certified Coating Fingerprint Quality Controller" Course


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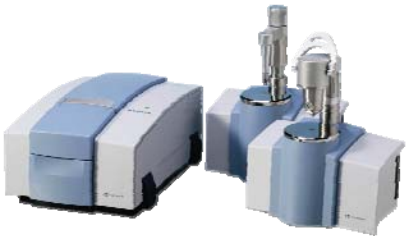
| **Date** | 23 & 24 February 2016 |
| **Time** | 9.00 am to 5.00 pm |
| **Venue** | Four Points Sheraton Hotel, Bandar Puteri, Puchong |

**Introduction**

IMM Coatings Fingerprint initiatives marked a quantum leap in year 2015, where registration of Coatings Fingerprinting under Cost Reduction Alliance Initiative 2.0 (CORAL 2.0) under Malaysia Petroleum Management (MPM) and requirement of Coating Fingerprint Certification requirement in PETRONAS Technical Standards (PTS) 15.20.03 (replacing previous PTS 30.48.00.31) was officially endorsed.

The training of the "IMM Certified Coating Fingerprint Quality Controller" Course was conducted by Assoc. Prof. Dr. Melissa Chan Chin Han from Universiti Teknologi MARA and Ms. Renee Teo Yong Yin from Bruker (M) Sdn Bhd. The 2-day course was carried out in six sessions which covered theory and hands-on modules. First batch of certified Coating Fingerprint Quality Controllers with all together 24 graduates were recorded. They are qualified to be the signatories on the Coating Fingerprint Certificate. Congratulations!!

Figure 1 The trainers of first "IMM Certified Coating Fingerprint Quality Controller" Course: Assoc. Prof. Dr. Melissa Chan Chin Han (behind) and Ms. Renee Teo Yong Yin (front)



The emphasis of the course was on

1. Why do we need to fingerprint coatings? And how can we do it?
2. Quality assurance and quality control of polymeric coatings through **IMM Coating Fingerprint Certification Scheme**
3. Practical guides on FTIR analysis of protective coatings.

Followings are the essential points raised during the course

**Q1**

**Dr. Mahmood Anwar** (Curtin University) mentioned other OEM industries need 3rd party's certification for their products or services such as Technischer Überwachungsverein (TÜV – Technical Inspection Association) or Underwriters Laboratories (UL) for European or North American markets, respectively. How do these 3rd-party testing laboratories conduct verification tests for coatings fingerprinting requirement? Currently, all of the existing technical specifications and standards on coatings fingerprinting are lacking of interpretation of FTIR spectra or the practical approaches on estimation of the degree of similarity between two FTIR spectra for the same or different polymeric coatings.

**Nurul Asni Mohamed** from PETRONAS GTS queried the readiness of 3rd-party laboratory to conduct verification tests for paint as required by the coatings fingerprinting initiatives.

**The Taskforce committee** identified the gaps for implementation and made the recommendations on the practical approaches for the execution of coatings fingerprinting.

Currently the sole Certification Body (CB) and training body of Coating Fingerprint Certification Scheme resides with IMM in Malaysia. Subsequently, Authorized Training Bodies (ATB) and Authorized Testing Centers (ATC) for this scheme will be appointed by IMM as the CB.

IMM is working towards collaborating with the local chapters of NACE (USA), Society for Protective Coatings (SSPC-USA) etc for standards development.

A single certification database will be established for official record of the number of qualified and certified Coating Fingerprint Quality Controller in Malaysia for the assurance of the quality of the protective coatings products used in the oil and gas industry.

Up-to-date, there is no independent 3rd-party authority or 3rd-party laboratory, which is appointed/accreditated to fingerprint coatings using FTIR by referring to practical guides. At the beginning of the implementation of Coating Fingerprint Certificate, the testing laboratory which fulfills the general criteria for 3rd-party testing laboratory for **Coating Fingerprint Certificate** will be appointed by the IMM Taskforce on Coatings Fingerprinting. The appointment as the 3rd-party testing laboratory should be recognized by the oil and gas users for a grace period of at least 3 years (e.g. from 1st July 2016 to 30th June 2019). In other words, (let's say) after 30th June 2019, the appointment as the 3rd-party testing laboratory for **Coating Fingerprint Certificate** shall be made based on its accreditation by Certification Body.

**Q2**

**Mr. Albert Lee Phiaw Seong** from Jotun (M) Sdn Bhd asked if the qualification of coatings fingerprinting conducted by 3rd-party testing laboratory is limited to structural analyses (*i.e.* FTIR).

**The Taskforce committee** recommended that **Coating Fingerprint Certificate** shall be submitted by paint manufacturer for qualification of coatings fingerprinting.

General criteria for in-house and 3rd-party testing laboratories for **Coating Fingerprint Certificate** cover (1) physical analyses [e.g. viscosity, density, color code, non-volatile matter (by mass), mass of Zn metal/Total Zn *etc*] and (2) structural analyses (*i.e.* FTIR). The testing laboratories shall have sufficient testing facilities.

**Q3**

**Mr. Lim Chuan Gee** from SIRIM Bhd asked which FTIR testing method to be specified in **Coating Fingerprint Certificate.**

**The Taskforce committee** recommended that the structural analyses (*i.e.* FTIR) follows ASTM D7588 with inclusion of all the additional test criteria set for **Coating Fingerprint Certificate** and additional recommendation [Ref. 1]. Methods used shall reference latest published document.

Ref 1: IMM Taskforce on Coatings Fingerprinting (Phase II) (2016) Tentative Coating Fingerprint Certificate for 2-component intermediate materials of polymeric coatings (Rev. 2.4 on 2 Jan 2016). Materials Mind, vol Jan 2016. Institute of Materials, Malaysia, Selangor, Malaysia

**Q4**

**Dr. Mahmood Anwar** from Curtin University asked about the minimum thickness of protective coatings.

Recommendation of **Taskforce** committee:-
The minimum thickness of different type of protective coating shall be referred to PETRONAS Technical Standards (2016) (Technical Specification) (PTS 15.20.03) (Protective Coatings and Linings), Technical specification of Shell Global Solutions International B. V. (Shell GSI) (2009) for Design and Engineering Practice (DEP 30.48.0031-Gen) on Protective Coatings for Onshore Facilities *etc.*

**Q5**

**Dr. Mahmood Anwar** from Curtin University asked who (the paint manufacturer or user) shall keep the FTIR reference files submitted by paint manufacturer for qualification of protective coatings. How can this Reference (FTIR) file be used by the 3rd-party testing laboratory for (1) scheduled client's audit or random client's audit as requested by client when deemed necessary and (2) verification test of the retained paint sample when there is/ are "doubt(s)" on the reproducibility and consistency of the paint formulation delivered on-site. The doubt(s) may arise from the on-site FTIR structural analysis by handheld or mobile FTIR spectrophotometer, visual inspection on the paint *etc.*

**The Taskforce committee** recommended that the Reference (FTIR) file shall be kept and provided by the user to the 3rd-party testing laboratory (submitted by the paint manufacturer during qualification of protective coatings).

**Q6**

Ms. Lee Sook Boi (PPG Coatings (M) Sdn Bhd) seek clarification on the procedure to submit paint sample to 3rd-party testing laboratory for verification of Reference (FTIR) file before submission of the Reference file to user for qualification of protective coatings.

**The Taskforce committee** recommended that same locations and timings of the paint samples drawn from the mixing tank to be analyzed by in-house and 3rd-party testing laboratories. However, the procedures on sampling collection from mixing tank and sampling method for the FTIR testing shall be established by the in-house testing laboratory.

**Q7**

**Dr. Mahmood Anwar** from Curtin University asked if the paint manufacturer changes the color of the paint supplied for a qualified paint, does the new color of the paint needs to be re-qualified?

**The Taskforce committee** recommended that re-qualification of paint is indeed needed if the color of the qualified paint is changed.

**Nurul Asni Mohamded** from PETRONAS GTS supported this requirement as the PETRONAS Technical Standards (2016) (Technical Specification) (PTS 15.20.03) (Protective Coatings and Linings) stated that "color" is one of the criteria for qualification of protective coatings.

**Q8**

**Dr. Mahmood Anwar** from Curtin University would like to know further on the measures to resolve the dispute of FTIR results (Pass & Fail) from two different testing laboratories.

**The Taskforce committee** recommended that two testing laboratories shall first complete Test Method Assessment checklist [provided by independent

party (e.g. to be appointed by IMM)] in the presence of representatives from both laboratories. Upon completion of checklist and site verification, both laboratories shall be required to test on a test sample (not limited to certified reference material) prepared by the paint manufacturer involved in the presence of representatives from both laboratories.


Figure 2 Theoretical session

Figure 3 Hands-on session

Figure 4 Private coaching time

Figure 5 The certified Coating Fingerprint Quality Controller after passing the course


Figure 6 Pn. Nurul Asni Mohmad, the chairperson of the IMM Taskforce of Coatings Fingerprinting delivered her closing remarks


Group photo